

has proposed the use of multiple, flexible, pre-bent steel nails, inserted intramedullarily just above the medial femoral condyle. From this site, just above the knee joint, the nails are advanced one at a time along the medullary canal, across the fracture and into the subchondral bone of the femoral head. Three to five nails are used, to gain multiple points of fixation. The procedure is done on a fracture table, using traction to align the fracture, and it requires the use of a c-arm fluoroscope, preferably with a disc recorder to minimize radiation exposure. The incision is distant from the fracture, and requires less exposure and blood loss. The nails are placed along the lines of stress of the proximal femur, and are less likely to fail. However, they do occasionally back out. Subsequent external rotation of the fracture can occur. Knee pain, related to the site of insertion, is an acknowledged problem.

Ender's procedure does appear, however, to be very successful in permitting a patient with an intertrochanteric fracture to be up and walking shortly after injury, with a much less invasive operation than conventional hip nailing. Ability to work does not seem compromised.

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New Methods In Treating Femoral Shaft Fractures

NEW METHODS in treating femoral shaft fractures have greatly reduced the expense and disability of this injury. These methods include the use of a quadrilateral cast brace and closed medullary nailing.

A quadrilateral cast brace utilizes some principles of a quadrilateral above knee prosthesis to control the position of the proximal fragment and allow early knee motion and ambulation of the patient. The cast may be applied after clinical stability is achieved with skeletal traction, or, in some selected cases, it may be applied and the patient allowed to move about before clinical stability of the fracture.

Closed medullary nailing requires sophisticated and expensive equipment but allows internal fracture stabilization without exposing the fracture site and, therefore, greatly reduces the risk of

infection. Properly done, fixation is usually secure enough to allow full weight-bearing without protection soon after the soft tissues have healed. Patients frequently resume most of their normal activities within four to six weeks after the procedure.

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Reconstruction of Bone Defects by Free Vascularized Bone Grafts

WITH RECENT ADVANCES in clinical microsurgery, free vascularized bone grafts to fill defects in long bones are now possible. Defects created by trauma or resection of bone for tumors have been filled by free vascularized grafts and reported by Weiland and Daniel.

The three donor bones used for free microvascular transfers are the fibula, rib and iliac crest. All bones are transferred on a vascular pedicle that is anastomosed by microvascular technique to vessels at the recipient site. The anatomic vascular arrangement has been studied in cadavers for each of these donor grafts. However, the authors recommend preoperative angiograms to define the vascular pattern in each individual case. The fibula is transferred with the peroneal vessels which are readily identified with microvascular technique and the rib grafts are vascularized by the intercostal vessels. The iliac crest has usually been transferred as part of a composite tissue-free groin flap vascularized by the superficial circumflex iliac and inferior epigastric vessels. Where only bone is necessary and particularly where long defects need to be filled, the fibula is the most suitable donor bone.

If the vascular anastomosis fails, the bone graft is no worse than a traditional free bone graft without a vascular pedicle. It has been shown, however, that the vascularized bone grafts heal faster and the nonunion rate will be less. Of the 13 cases reported, nine bony defects were due to trauma and four were created following bony resection for locally aggressive or malignant lesions.

Microvascular surgery has opened up this new reconstructive technique which may allow less